

AMENDMENTS TO THE CLAIMS:

The following claim listing replaces all prior listings and versions of the claims:

LISTING OF CLAIMS

1. (Currently amended) A high-hardness conductive diamond polycrystalline body formed substantially with diamond, wherein

said diamond has a maximum particle diameter of at most 100 nm and an average particle diameter of at most 50 nm, and a particle of said diamond includes at least 100 ppm and at most 1,000 ppm of boron,

said boron is included in a lattice site of said particle of said diamond, and

said high-hardness conductive diamond polycrystalline body is obtained by directly converting a graphite-type carbon material including boron as a solid solution into diamond without adding a sintering aid and catalyst, and concurrently sintering at high temperature and high pressure, so that said boron is included in a lattice site of said particle of said diamond.
2. (Original) The high-hardness conductive diamond polycrystalline body according to claim 1, wherein

said diamond has a specific resistance of at most 10 Ω cm.
3. (Original) The high-hardness conductive diamond polycrystalline body according to any of claims 1 and 2, wherein

said diamond has a maximum particle diameter of at most 50 nm and an average particle diameter of at most 30 nm.
4. (Original) The high-hardness conductive diamond polycrystalline body according to any of claims 1 and 2, wherein

said polycrystalline body has a hardness of at least 80 GPa.

5. (Original) The high-hardness conductive diamond polycrystalline body according to claim 4, wherein

said polycrystalline body has a hardness of at least 110 GPa.

6. (Withdrawn) A method of producing a high-hardness conductive diamond polycrystalline body, wherein

graphite including boron is mechanically milled with a tool including a planetary ball mill in an inert gas to form a graphite-type carbon material including amorphous or fine boron, and the graphite-type carbon material is directly converted into diamond and concurrently sintered at a temperature of at least 1,500 °C and in a pressure condition wherein diamond is thermodynamically stable without adding a sintering aid or a catalyst thereto.

7. (Withdrawn) The method of producing a high-hardness conductive diamond polycrystalline body according to claim 6, wherein

said graphite-type carbon material including amorphous or fine boron has a maximum particle diameter of at most 100 nm.

8. (Withdrawn) The method of producing a high-hardness conductive diamond polycrystalline body according to claim 6, wherein

said graphite-type carbon material including amorphous or fine boron has a maximum particle diameter of at most 50 nm.

9. (Withdrawn) The method of producing a high-hardness diamond polycrystalline body according to claim 6, wherein

said graphite-type carbon material including amorphous or fine boron has a crystallite size of at most 50 nm, said crystallite size is obtained from a half-width of a (002) diffraction line of an X-ray diffraction pattern of said graphite-type carbon material.

10. (Withdrawn) The method of producing a high-hardness diamond polycrystalline body according to claim 6, wherein

said graphite-type carbon material including amorphous or fine boron has a crystallite size of at most 10 nm, said crystallite size is obtained from a half-width of a (002) diffraction line of an X-ray diffraction pattern of said graphite-type carbon material.

11. (Withdrawn) The method of producing a high-hardness diamond polycrystalline body according to claim 6, wherein

a (002) diffraction line is unrecognizable in an X-ray diffraction pattern of said graphite-type carbon material including amorphous or fine boron.

12. (Currently amended) A high-hardness conductive diamond polycrystalline body formed substantially with diamond, wherein

said diamond has a maximum particle diameter of at most 10,000 nm and an average particle diameter of at most 5,000 nm,

a particle of said diamond includes at least 1,000 ppm and at most 100,000 ppm of boron,

said boron is included in a lattice site of said particle of said diamond, and

said high-hardness conductive diamond polycrystalline body is obtained by directly converting a graphite-type carbon material including boron as a solid solution into diamond without adding a sintering aid and catalyst, and concurrently sintering at high temperature and high pressure, so that said boron is included in a lattice site of said particle of said diamond.

13. (Original) The high-hardness conductive diamond polycrystalline body according to claim 12, wherein

said diamond has a specific resistance of at most 1 Ωcm .

14. (Original) The high-hardness conductive diamond polycrystalline body according to any of claims 12 and 13, wherein

said diamond has a maximum particle diameter of at most 1,000 nm and an average particle diameter of at most 500 nm.

15. (Original) The high-hardness conductive diamond polycrystalline body according to any of claims 12 and 13, wherein

said polycrystalline body has a hardness of at least 80 GPa.

16. (Original) The high-hardness conductive diamond polycrystalline body according to claim 15, wherein

said polycrystalline body has a hardness of at least 110 GPa.

17. (Withdrawn) A method of producing a high-hardness conductive diamond polycrystalline body, wherein

a carbon material including at least 10 ppm and at most 100,000 ppm of boron is directly converted into diamond and concurrently sintered in a pressure condition wherein diamond is thermodynamically stable without adding a sintering aid or a catalyst thereto.

18. (Withdrawn) The method of producing a high-hardness diamond polycrystalline body according to claim 12, wherein

said carbon material including boron is amorphous carbon.

19. (Withdrawn) The method of producing a high-hardness diamond polycrystalline body according to claim 12, wherein

said carbon material including boron is graphite-type carbon.

20. (Withdrawn) The method of producing a high-hardness diamond polycrystalline body according to claim 12, wherein

said carbon material including boron is formed with graphite-type carbon and boron carbide.

21. (Withdrawn) A method of producing a high-hardness conductive diamond polycrystalline body, wherein

said carbon material including boron is diamond-like carbon, and is sintered without adding a sintering aid or a catalyst thereto.